US 20210142152A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2021/0142152 A1**

BURKHART et al. (43) **Pub. Date: May 13, 2021**

(54) **USER CLASSIFICATION FROM DATA VIA DEEP SEGMENTATION FOR SEMI-SUPERVISED LEARNING**

(71) Applicant: **ADOBE INC.**, San Jose, CA (US)

(72) Inventors: **MICHAEL BURKHART**, San Jose, CA (US); **Kyle Shan**, Palo Alto, CA (US)

(21) Appl. No.: **16/681,239**

(22) Filed: **Nov. 12, 2019**

Publication Classification

(51) **Int. Cl.**

G06N 3/04	(2006.01)
G06N 20/10	(2006.01)
G06F 17/18	(2006.01)
G06K 9/62	(2006.01)

(52) **U.S. Cl.**

CPC ***G06N 3/0472*** (2013.01); ***G06N 3/0454*** (2013.01); ***G06K 9/6267*** (2013.01); ***G06F 17/18*** (2013.01); ***G06N 20/10*** (2019.01)

(57) **ABSTRACT**

Systems and methods are described for user classification with semi-supervised machine learning. The systems and methods may include receiving user information for a first set of users, receiving survey data for a second set of users wherein the second set of users is a proper subset of the first set of users, training a first neural network and a second neural network based on the second set of users, mapping the user information for the first set of users to the embedding space using the first neural network, predicting category membership propensities for the first set of users using a low-density separation algorithm on the user information for the first set of users mapped to the embedding space, updating the first neural network and the second neural network based on the prediction, and reclassifying the first set of users based on the updated first neural network and the updated second neural network.